



March 28, 2023

The Honorable Jennifer Granholm  
Secretary  
U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

Dear Secretary Granholm:

The Hydrogen Fuel Cell Bus Council is writing to impress upon the Department of Energy the benefits that hydrogen fuel cell electric buses will bring to the Regional Clean Hydrogen Hubs program (H2Hubs).

#### Exponential Greenhouse Gas Emission Reductions

While the list of eligible end users in a H2 Hub is broad, transportation is an important area of focus. In 2021, greenhouse gas emissions from all transportation activities accounted for the largest portion (29.0 percent) of total gross emissions.<sup>1</sup> The Hydrogen Fuel Cell Bus Council believes the Hydrogen Hubs should have a strong focus on reducing the largest source of greenhouse gas emissions.

It is critical to understand that zero emission buses (both battery electric and hydrogen fuel cell electric) can drastically reduce emissions in two ways. The direct way is by eliminating the 1.05 billion gallons of fossil fuels that were consumed in 2019 by the public transit industry.<sup>2</sup> While other end users will also directly eliminate greenhouse gas emissions in their sectors, public transit will also exponentially eliminate much greater amounts of greenhouse gas emissions.

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<sup>1</sup> EPA (2023) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. U.S. Environmental Protection Agency, EPA 430-D-23-001. <https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissions10-and-sinks-1990-2021>.

<sup>2</sup> 2021 American Public Transportation Association Factbook. Page 20.

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The Hydrogen Fuel Cell Bus Council believes that this secondary impact is a result of zero emission buses boosting transit ridership. People are excited to ride modern innovative buses that provide a cleaner and quieter ride.<sup>3</sup> Known as *mode shift*, this can significantly magnify the greenhouse gas emission reductions by pulling people out of private vehicles and into modern zero emission buses. Dirty and loud diesel buses are a thing of the past, and zero emission buses will encourage more mode shift and boost the perception of public transit as green transportation.

### Transit Agencies Amplify Transportation Equity

Transit agencies have decades of experience engaging with their communities to provide equity by connecting low income communities to job centers, hiring diverse staff that reflect the communities they serve, and ensuring all members of the community have access to transportation options.

In fact, 69 percent of bus riders make under \$50,000.<sup>4</sup> These agencies have been striving to meet Justice 40 goals for decades by serving disadvantaged communities that are marginalized, underserved, and overburdened by pollution. When combined, communities of color make up a majority of riders (60%), with Black/African-American riders comprising the largest single group (24%) within communities of color.<sup>5</sup> This in part reflects the fact that people of color are far more likely not to have a car, including 18 percent of Black households, 13 percent of Native households, 11 percent of Latino/Hispanic households, and 11 percent of Asian American/Pacific Islanders, compared to 6 percent of white households.<sup>6</sup>

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<sup>3</sup> The Impact of Electric Buses on Urban Life. Policy Brief, the International Association of Public Transport. June 2019.

<sup>4</sup> American Public Transportation Association. Who Rides Public Transportation. January 2017. Page 36.

<sup>5</sup> American Public Transportation Association. Who Rides Public Transportation. January 2017. Page 20..

<sup>6</sup> Car Access, National Equity Atlas,  
[https://nationalequityatlas.org/indicators/Car\\_access#/?geo=0100000000000000](https://nationalequityatlas.org/indicators/Car_access#/?geo=0100000000000000)



Additionally, public transit employment itself is a pathway to economic mobility for people of color. Workers of color overall account for half of vehicle operators and form a large share of frontline transit workers.<sup>7</sup>

### Commercial Feasibility

Hydrogen fuel cell electric buses have already demonstrated commercial feasibility. For example, Sun Line Transit has a decade of experience operating hydrogen fuel cell electric buses. Their experience demonstrates that hydrogen fuel cell electric buses are a 1:1 replacement of conventional buses enabling greater flexibility for route planning and operations as compared to battery electric buses. Their hydrogen fuel cell electric buses also excelled in all weather conditions, while battery electric bus range diminishes in cold weather.<sup>8</sup> SARTA, an Ohio transit agency with cold winters saw a loss in range going from 50-60°F to 22-32°F was greater for battery electric buses (37.8% decrease) than for fuel cell electric buses (23.1% decrease)<sup>9</sup>

Members of this coalition strongly support all electric buses, but hydrogen fuel cell electric buses can address other technology's shortcomings with a proven range of up to 300 miles and significantly faster refueling.

Furthermore, hydrogen fuel cell electric buses are well positioned to grow into a sizable market share due to infrastructure cost and operational advantages at scale. Investments in hydrogen refueling are significant, but adding more hydrogen fuel cell electric buses makes the cost per bus drop because a refueling station can handle a large number of buses once established.<sup>10</sup> This makes hydrogen fuel cell electric bus fleets easy to scale up.

### Roving Public Billboards

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<sup>7</sup> Transit Center. Invest in Transit Equity, Invest in Transit Workers. February 2022

<sup>8</sup> Sunline Transit.. <https://www.youtube.com/watch?v=A2DoEzf0LCE>

<sup>9</sup> Henning, Mark; Thomas, Andrew R.; and Smyth, Alison, "An Analysis of the Association between Changes in Ambient Temperature, Fuel Economy, and Vehicle Range for Battery Electric and Fuel Cell Electric Buses" (2019). Urban Publications. 0 1 2 3 1630. [https://engagedscholarship.csuohio.edu/urban\\_facpub/1630](https://engagedscholarship.csuohio.edu/urban_facpub/1630)

<sup>10</sup> Center for Transportation and the Environment. Response to the Select Committee on the Climate Crisis's Request for Information. November 2019. <https://cte.tv/response-to-select-committee-2019/>



Public awareness of hydrogen remains low. While voters have low levels of awareness on clean hydrogen and its uses, just a small amount of information generates favorable feelings toward hydrogen.

A May 2022 poll demonstrated that only 11% of voters say that they have read or heard a lot about hydrogen. Even fewer voters (7%) recall reading or hearing a lot about clean hydrogen, with a solid majority (69%) only recalling a little or nothing at all. That said, upon reading an initial description of clean hydrogen and the role it can play in our energy future, 75% of voters say they feel favorably toward clean hydrogen.<sup>11</sup>

Hydrogen fuel cell electric buses provide a public education opportunity unique to all other H2Hubs end users. Public transit buses are effectively “roving billboards” demonstrating to the general public the benefit of a hydrogen economy. Please imagine a bus wrapped with advertisements touting “This bus powered by clean hydrogen,” driving through a city. These buses can demonstrate hydrogen safety, zero emission technology in action, and highlight a modern innovative city. The opportunities for hydrogen awareness amongst the general population, transit riders, and other vehicles driving alongside a bus are endless.

The Hydrogen Fuel Cell Bus Council hopes to be a resource to you and your staff as the work of the H2Hubs and other hydrogen initiatives move forward.

Respectfully,

A handwritten signature in blue ink, appearing to read "Karl P. Gnad", is written over a large, stylized blue scribble.

Karl P. Gnad  
President  
Hydrogen Fuel Cell Bus Council

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<sup>11</sup> Hart Research Associate and Meeting Streets, May 27, 2022 <https://breakthroughenergy.org/wp-content/uploads/2022/10/ME-14289-BE-Hydrogen-Memo.pdf>